

REMARKS

Claims 1–5 and 7 are pending in this application. By this Amendment, claim 1 is amended and claim 7 is added. Support for the amendments to claim 1 and added claim 7 can be found, for example, at least in paragraphs [0027], [0038]–[0040] and [0042]–[0044] of the original specification. No new matter is added. Applicants respectfully request reconsideration and prompt allowance in view of at least the following remarks.

The Office Action rejects claims 1–5 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Specifically, the Office Action alleges that the specification does not support the recitation in claim 1 regarding an organic compound "whose boiling point is the same as naphthalene." Claim 1 is amended to recite "the organic compound comprising naphthalene," which Applicants assert is sufficiently supported by the specification to convey that the inventors had possession of the claimed invention. Applicants respectfully request withdrawal of the rejection.

The Office Action rejects claims 1, 3 and 5 under 35 U.S.C. §103(a) over U.S. Patent No. 3,638,399 (Walker) in view of U.S. Patent No. 5,466,645 (Hayden). Applicants respectfully traverse the rejection.

Walker discloses that polymer precursors and higher molecular weight compounds in hydrocarbon pyrolysis gas can be removed by contacting the gas with activated carbon (Walker at col. 1, lines 24–28). Walker discloses that specific molecules that can be removed by activated carbon include triacetylene, naphthalene and other acetylene-containing gases (Walker at col. 1, lines 39–41). However, Walker is silent as to controlling the pore size of the activated carbon using any one of the above organic compounds.

Rather, Walker discloses that a pyrolysis gas stream is passed through a column of packed activated carbon until the activated carbon is saturated (Walker at col. 1, lines 42–47). Walker discloses that the activated carbon preferably has at least 50 percent of the pores with

diameters greater than 50 angstrom (Walker at col. 2, lines 41–46). A particular activated carbon used is Pittsburgh Type SGL which has a pore volume distribution of 67% with diameters greater than 25 angstrom, 15% between with diameters between 15, and 25 angstrom and 18% with diameters less than 15 angstrom (Walker at col. 2, lines 51–56). Walker discusses that the activated carbon is reactivated by heating it with steam or inert flue gas at a temperature of 150°C to 500°C, and preferably 250°C to 425°C to remove the C₆ to C₁₀ hydrocarbons, or more substantially reactivated by heating the activated carbon to temperatures of 700°C to 1,100°C, and preferably 900°C to 1,100°C.

However, Walker fails to disclose or render obvious "to selectively close pores of the activated carbon with a diameter less than 20 Å," as recited in claim 1. The activated carbon disclosed in Walker is either fully saturated or reactivated by removing the absorbed organic compounds but Walker does not disclose that the pores with a diameter less than 20 Å are closed after desorbing the organic compound. Importantly, Hayden does not cure this deficiency. Accordingly, claim 1 is patentable over Walker in view of Hayden. Claims 3 and 5 are also patentable, at least in view of the patentability of claim 1, from which they depend, as well as the for the additional features the claims recite. Therefore, Applicants respectfully request withdrawal of the rejection.

The Office Action rejects claims 1–5 under 35 U.S.C. §103(a) over Control of Micropores of Molecular Sieving Carbon by Impregnation of Hydrocarbons and Heat Treatment, Nakano et al. (Nakano) in view of Hayden. Applicants respectfully traverse the rejection.

Nakano discusses methods for controlling micropore size, including (1) vacuum-evaporating carbon and (2) covering micropores with thermally decomposed carbon by heat treating (Nakano at page 2). Neither of these methods disclose or render obvious the methods

recited in claim 1. Neither of these methods disclose or render obvious an activated carbon having pores with a diameter less than 20 Å closed.

Rather, Table 1 of Nakano discloses multiple samples MSC-XA, A–D and MSC-5A with pore sizes ranging from ~2.8 to 5 Å. Specifically, Sample A represents the untreated precursor, with 94% of the micropore sizes being 4–5 Å and 6% of the micropore sizes being 2.8–4 Å. After being treated with the various compound listed in Samples B–D, the micropore sizes flip so that 90% of the micropores have a diameter of 2.8–4 Å and 10% of the micropores have a diameter of 4–5 Å. Because Nakano does not disclose that the micropores with a diameter less than 20 Å are closed, there are differences between the different processes discussed in Nakano and the methods recited in the claims of the current application. Therefore, Nakano does not disclose closing "pores of the activated carbon with a diameter less than 20 Å," as variously recited in claim 1 of the current application.

Because Hayden does not cure the noted deficiency of Nakano, claim 1 is patentable over Nakano in view of Hayden. Accordingly, claim 1 is patentable over Walker in view of Hayden. Claims 2–5 are also patentable, at least in view of the patentability of claim 1, from which they depend, as well as the for the additional features the claims recite. Therefore, Applicants respectfully request withdrawal of the rejection.

The Office Action rejects claims 1–5 under 35 U.S.C. §103(a) over U.S. Patent No. 5,260,047 (Berger) in view of U.S. Patent No. 4,685,220 (Meenan). Applicants respectfully traverse the rejection.

Berger is directed to a process for purifying waste gases containing polyhalogenated compounds, by adsorbing and desorbing an adsorption agent that removes the polyhalogenated compounds from activated carbon used to purify the waste gas (Berger at col. 1, lines 11–15). Berger discloses that lignite coke, which is particularly suited for adsorbing polyhalogenated compounds, is used as the activated coke (Berger at col. 3, lines

34–36). Spent coke, or coke that is saturated with the harmful polyhalogenated compounds, is drawn off from the scrubbing position along the waste gas pipe to be reactivated (Berger at col. 3, lines 37–40). Berger discloses a heating zone 11 and a cooling or quench zone 12 that are used to destroy or decompose the polyhalogenated compounds, such as dioxins and furans (Berger at col. 3, lines 58–61).

Importantly, Berger discloses that the quench zone 12 is used to prevent the recombination of residual decomposition products incorporated into the activated coke (Berger at col. 4, lines 18–22). Berger discloses that some free decomposition gases would be physically trapped in free spaces between particles of activated coke and that these gases need to be removed to reactivate the coke (Berger at col. 4, lines 22–26).

Based on the foregoing, Berger at least fails to disclose or render obvious the recited features of independent claim 1 because Berger is directed to purely reactivating activated coke used in the scrubbing process of waste gas stream and not producing activated carbon. Additionally, because Berger discloses that all of the adsorbed and trapped gases within the interstitial spaces of the activated coke must be removed to reactivate the activated coke, Berger teaches away from using an organic compound to control the size of the pores of the activated coke so that pores of the activated carbon with a diameter less than 20 Å are closed. Accordingly, Berger fails to disclose or render obvious all of the features recited in independent claim 1. Because Meenan fails to cure the deficiency of Berger, claim 1 is patentable over Berger in view of Meenan.

Claims 2–5 are also patentable, at least in view of the patentability of claim 1, from which they depend, as well as the for the additional features the claims recite. Therefore, Applicants respectfully request withdrawal of the rejection.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:

Request for Continued Examination

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